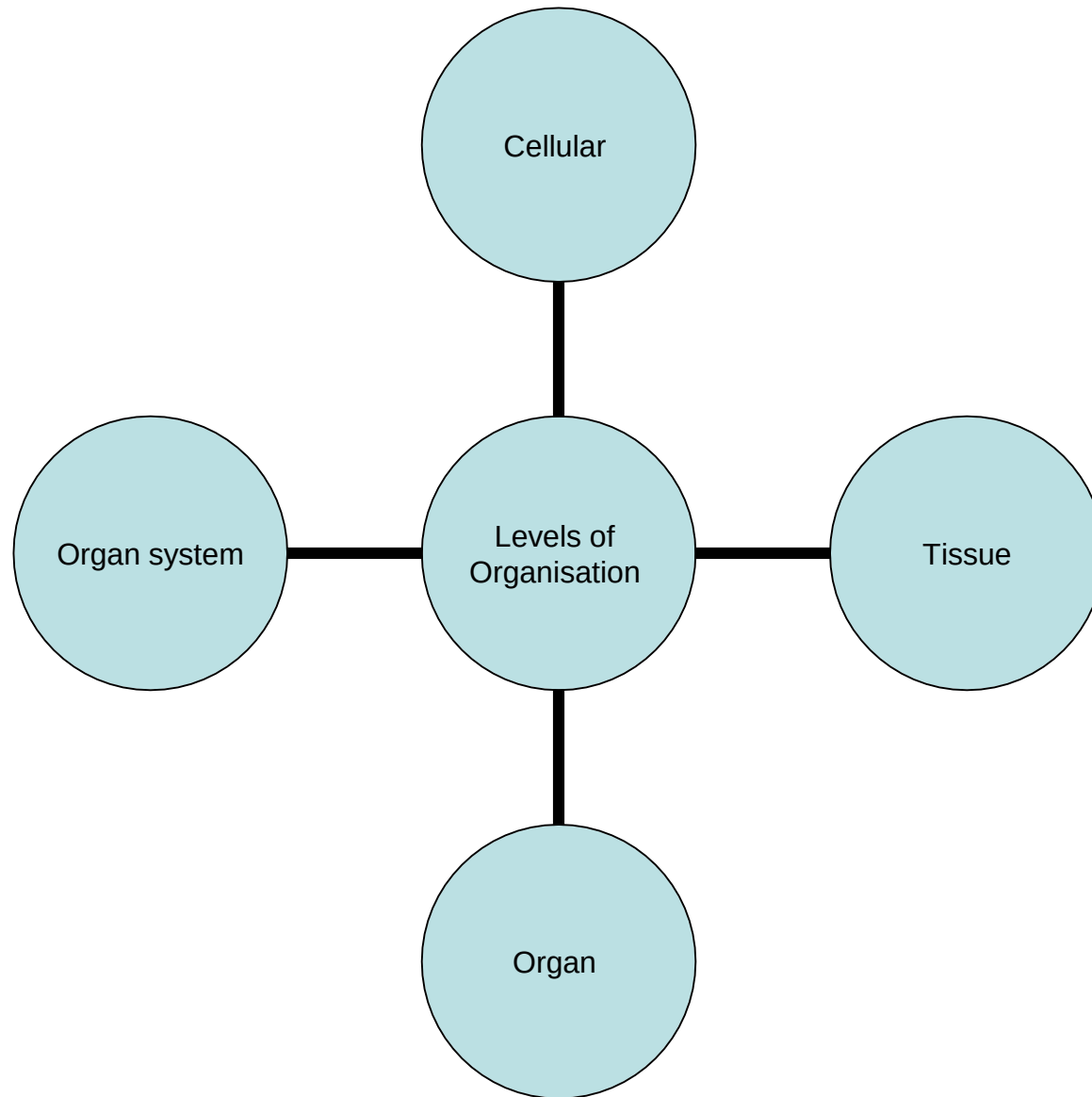


Animal Kingdom

Basis of classification

- Arrangement of cells
- Body symmetry
- Nature of coelom
- Patterns of systems



Body Symmetry

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graph TD; A[Body Symmetry] --> B[Asmmetrical]; A --> C[Radial]; A --> D[Bilateral];
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A hierarchical diagram with a light blue rounded rectangular box at the top containing the text 'Body Symmetry'. A vertical black line descends from the bottom center of this box and connects to a horizontal black line. From the left end of this horizontal line, a vertical black line descends to the top center of a light blue rounded rectangular box containing the text 'Asmmetrical'. From the right end of the horizontal line, a vertical black line descends to the top center of a light blue rounded rectangular box containing the text 'Bilateral'. The central part of the horizontal line continues straight down to the top center of a light blue rounded rectangular box containing the text 'Radial'.

Asmmetrical

Radial

Bilateral

Diploblastic and Triploblastic organisation

- Ectoderm

Ectoderm forms tissues associated with outer layers: skin, hair, sweat glands, epithelium, brain and nervous system.

- Mesoderm

The mesoderm forms structures associated with movement and support: body muscles, cartilage, bone, blood, and all other connective tissues and reproductive system organs and kidneys.

- Endoderm

The endoderm forms tissues and organs associated with the digestive and respiratory systems, endocrine structures, such as the thyroid and parathyroid glands, the liver, pancreas, and gall bladder.

Coelom

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graph TD; Coelom[Coelom] --- Line1[ ]; Line1 --- Acoelomate[Acoelomate]; Line1 --- Pseudocoelomate[Pseudocoelomate]; Line1 --- coelomate[coelomate];
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Acoelomate

Pseudocoelomate

coelomate

Metameric Segmentation

External and internal division of body into segments with a serial repetition of at least some organs

Porifera

- Asymmetrical
- Cellular level of organisation
- Presence of water canal system
- Choanocytes are present
- Calcareous spicules are present
- Hermaphrodite
- Internal fertilisation and indirect development
- Intracellular digestion

Coelenterata

- Radial symmetry
- Presence of cnidoblast
- Tissue level of organisation
- Single opening called hypostome is present
- Alternation of generation
- Digestion is extracellular and intracellular

Ctenophora

- Radial symmetry
- Diploblastic
- Tissue level of organisation
- Eight external rows of ciliated comb plates
- Extracellular and intracellular digestion
- Hermaphrodite
- Bioluminescence
- External fertilisation with indirect development

Platyhelminthes

- Endoparasites
- Dorsoventrally flattened, organ system level of organization, Bilaterally symmetrical, Triploblastic
- Acoelomate
- Cephalization starts
- Absence of locomotory organs, circulatory system
- Hermaphrodite
- Flame cells are present
- Internal fertilization with indirect development

Aschehelminthes

- Endoparasites
- Organ system level of organisation
- Triploblastic, bilaterally symmetrical, Pseudocoelomate
- Complete digestive system
- Absence of locomotory organs,
- Body wall consists of cuticle, epidermis and muscular layer
- Sexual dimorphism
- Fertilisation is internal
- Direct development

Annelida

- Organ system level of organisation
- Triploblastic, coelomate, bilateral symmetry
- Metameric segmentation
- Setae or parapodia help in locomotion
- Body wall consists of cuticle, epidermis and well developed musculature
- Closed circulatory system
- Nephridia
- Paired ganglia are present
- Unisexual or bisexual
- Direct or indirect development

Arthropoda

- Organ system level, Bilaterally symmetrical
- Triploblastic
- Chitinous exoskeleton, sense organs
- Moulting or ecdysis is common
- Open circulatory system, Complete digestive system
- Jointed appendages
- Respiration takes place by trachea, book-lungs, gills etc.
- Head thorax and abdomen are three parts of body
- Malpighian tubules are present
- Paired ganglia are present
- Sexes are separate, external fertilization, oviparous, indirect development

Mollusca

- Organ system level
- Bilaterally symmetrical
- Triploblastic
- Calcareous shell
- Head, muscular foot and visceral hump
- Mantle cavity contains gills, secretes shell
- Complete digestive system
- Open circulatory system
- Cerebral, visceral and pedal ganglia are present
- Mouth has rasping organ called radula
- Unisexual or bisexual

Echinodermata

- Organ system level
- Larva is bilaterally symmetrical and adult is radially symmetrical
- Triploblastic
- Pedicellariae are present on the skin
- Complete digestive system
- Water vascular system
- Sexes are separate
- Indirect development

Hemichordata

- Organ system level of organisation
- Bilaterally symmetrical
- Triploblastic
- Coelomate
- Body is composed of proboscis, collar and trunk
- Open circulatory system
- Sexes separate
- External fertilisation
- Digestive system is complete
- Pharyngeal gill slits
- Indirect development

Differences between chordates and non-chordates

Chordates

- Notochord present
- Dorsal central nervous system, hollow and single
- Pharynx perforated by gill slits
- Heart is ventral
- Post anal tail is present

Non-chordates

- Notochord absent
- ventral central nervous system, solid and double
- Gill slits are absent
- Heart is dorsal if present
- Post anal tail is absent

Urochordata

- Notochord is present only in larval tail.
- Nerve cord is present in larva.
- Body is covered by thick tunic.
- Asymmetrical.
- Indirect development.
- Gill slits are found.
- Retrogressive metamorphosis

Cephalochordata

- Notochord is persistent throughout life.
- Tunic is absent.
- Gill slits are present.
- Protonephridia for excretion
- Closed circulatory system
- Unisexual
- Indirect development
- Progressive metamorphosis

Cyclostomata

- 6-15 pairs of gill slits
- Sucking and circular mouth without jaws.
- Scales and paired fins absent
- Cartilaginous skeleton
- Fins are unpaired
- Two chambered heart
- External fertilisation
- They are marine but migrate to fresh water for laying eggs

Chondrichthyes

- Marine
- Mouth is ventral
- Notochord is persistent
- Open gill slits
- Placoid scales are present
- Teeth are modified placoid scales
- Two chambered heart
- Air bladder is absent
- Cartilaginous skeleton
- Sexes separate and internal fertilisation
- Viviparous

Osteichthyes

- Bony skeleton
- Mouth terminal
- Four pairs of gills covered by operculum
- Cycloid or ctenoid scales
- Air bladder is present
- Heart two chambered
- Sexes separate
- External fertilisation and oviparous
- Development is direct

Amphibia

- Two pairs of limbs
- Body is divisible into head and trunk
- Skin is moist and without scales
- The eyes have eyelids.
- A tympanum is present.
- Alimentary canal, urinary and reproductive tracts open into a common chamber called cloaca.
- Respiration is by gills, lungs and through skin.
- Heart is three chambered.
- Cold blooded.
- Sexes are separate, external fertilisation and indirect development.

Reptilia

- Body is covered by scales.
- Tympanum represents ear.
- Two pairs of limbs(if present).
- Heart is three chambered except crocodile
- Sexes are separate and internal fertilization.
- Oviparous and direct development.

Aves

- **Presence of feathers and beak**
- **Forelimbs are modified into wings**
- **Skin is dry without glands except the oil gland at the base of the tail.**
- **Pneumatic bones are present.**
- **Additional chambers, present in digestive tract are crop and gizzard.**
- **Heart is four chambered**
- **Warm blooded animals**
- **Fertilization is internal, oviparous and development is direct.**
- **Respiration is lungs.**

Mammalia

- Presence of mammary glands
- Two pairs of limbs
- Presence of hair
- External ear or pinna is present
- Heart is four chambered
- Respiration is by lungs
- Viviparous